


# ONKYO SERVICE MANUAL

## STEREO CASSETTE TAPE DECK MODEL TA-RW11

Black and silver models

UDN, UDC, UD	120V AC, 60Hz
UG	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQA, UQB	240V AC, 50Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### SPECIFICATIONS

Track System:	4-track, 2-channel stereo
Recording System:	AC bias
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec (1-7/8 i.p.s.)
Wow and Flutter:	0.05% (WRMS)
Frequency Response:	20 – 15,000Hz (normal) (30 – 14,000Hz ± 3dB) 20 – 16,000Hz (High) (30 – 15,000Hz ± 3dB) 20 – 17,000Hz (Metal) (30 – 16,000Hz ± 3dB)
S/N Ratio:	Dolby NR out: 60dB (metal position tape) A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B. A noise reduction of 20dB at 5kHz is possible with Dolby C.
Input Jacks:	Line IN: 2 Minimum input level: 50mV Input impedance: 50 kohms Microphone Jack: 1 Minimum input level: 1.0mV/600 ohms Input impedance: 5 kohms
Outputs:	Line OUT: 2 Std output level: 500mV (OdB) Opt load impedance: over 50 kohms Headphone Jack: Opt load impedance: 8 to 200 ohms
Motors:	DC servo motor: 2 DC motor: 4



Heads:	Hard Permalloy: 2 (rec/pb) Ferrite erase head: 1
Semiconductors:	TR: 94 Diodes: 50 IC: 15 LED: 17
Power Supply:	AC 120V/60Hz
Power Consumption:	35 watts
Dimensions:	418(W) x 115(H) x 336(D) mm (16-1/2" x 4-1/8" x 13-1/4")
Weight:	6.9 kg. (15.2 lbs.)

Specifications and external appearance are subject to change without notice because of product improvements.

## FEATURES

### Two Auto-Reverse Tape Compartments

Both tape compartment 1 (playback only) and 2 (recording and playback) use an auto-reverse mechanism. That means you can make recordings using both sides of a cassette with no worries, even when dubbing cassettes from tape compartment 1 to compartment 2. With a C-60 cassette, for example, it's possible to record programs up to one hour long with hands-off simplicity.

### Computer-Controlled 6-Motor Configuration

Each tape compartment is equipped with 3 motors (including motors to move each of the head assemblies).

Computer control gives the deck full logic convenience so there's no need to press the stop button when switching tape transport modes.

### Dolby B and C Noise Reduction

Along with standard Dolby B NR, this deck also has the even more effective Dolby C NR system. Dolby C NR reduces tape background noise by 20dB at 5kHz, about 3 times more than Dolby B NR. In addition to its wide band noise reduction, Dolby C NR uses a sliding band technique that varies the band width of noise reduction according to the input level, thereby avoiding noise "pumping." Dolby C NR also has an anti-saturation effect to reduce the chance of tape saturation in the high range. All these features combine to eliminate the adverse effects on tape sound that other noise reduction systems can cause.

### 12-Hour Auto-Reverse Relay Playback

In the auto-reverse relay mode, auto-reverse playback of the cassette in tape compartment 2 begins immediately after both sides of the cassette in tape compartment 1 have been played back. This sequence can be repeated up to four times for extended uninterrupted playback. With a C-90 cassette, for example, this mode can provide up to 12 hours of nonstop music (180 minutes x 4 times).

### One-Touch Synchronized Dubbing Start-Up

Dubbing cassettes on this deck is easy. Simply put tape compartment 2 in the dubbing/pause standby mode and press the play button of tape compartment 2. Tape compartment 1 will automatically switch to the playback mode the instant recording of cassette 2 begins.

### Auto Music Control System (AMCS) and AMCS Standby

Tape compartment 1 is equipped with the AMCS function which automatically plays the first 10 seconds of every song on a cassette in either the forward or reverse direction depending on the head direction. To stop AMCS and resume normal playback from that point, just press the play button. When the AMCS standby function is used instead, tape is wound to the beginning of a song and stops. This is very useful when copying cassettes.

### Many Other Useful Features

In addition to the above-mentioned features, this deck also has a mic mixing capability, an auto space rec mute button, fully automatic tape selection and easy-to-read peak level meters.

## SERVICE PROCEDURES

### 1. Insulation resistance measurement

Connect the insulating-resistance tester between the plug of power supply cord and chassis.

Specifications; D model	500 V 3.3+0.33 M
G/W models	500 V more than 10 M

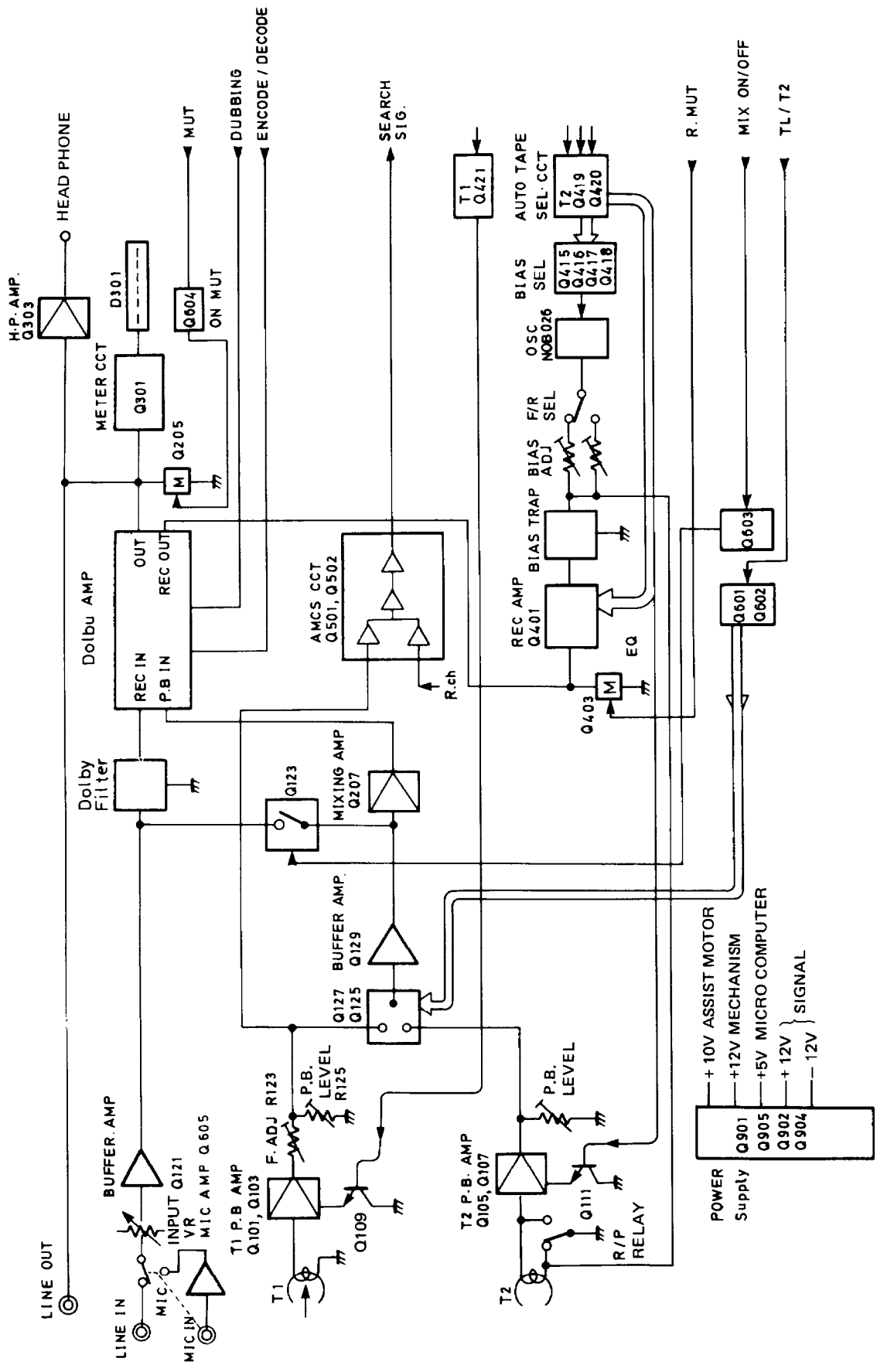
### 2. Replacing the lamps

This unit used the lamps listed below.

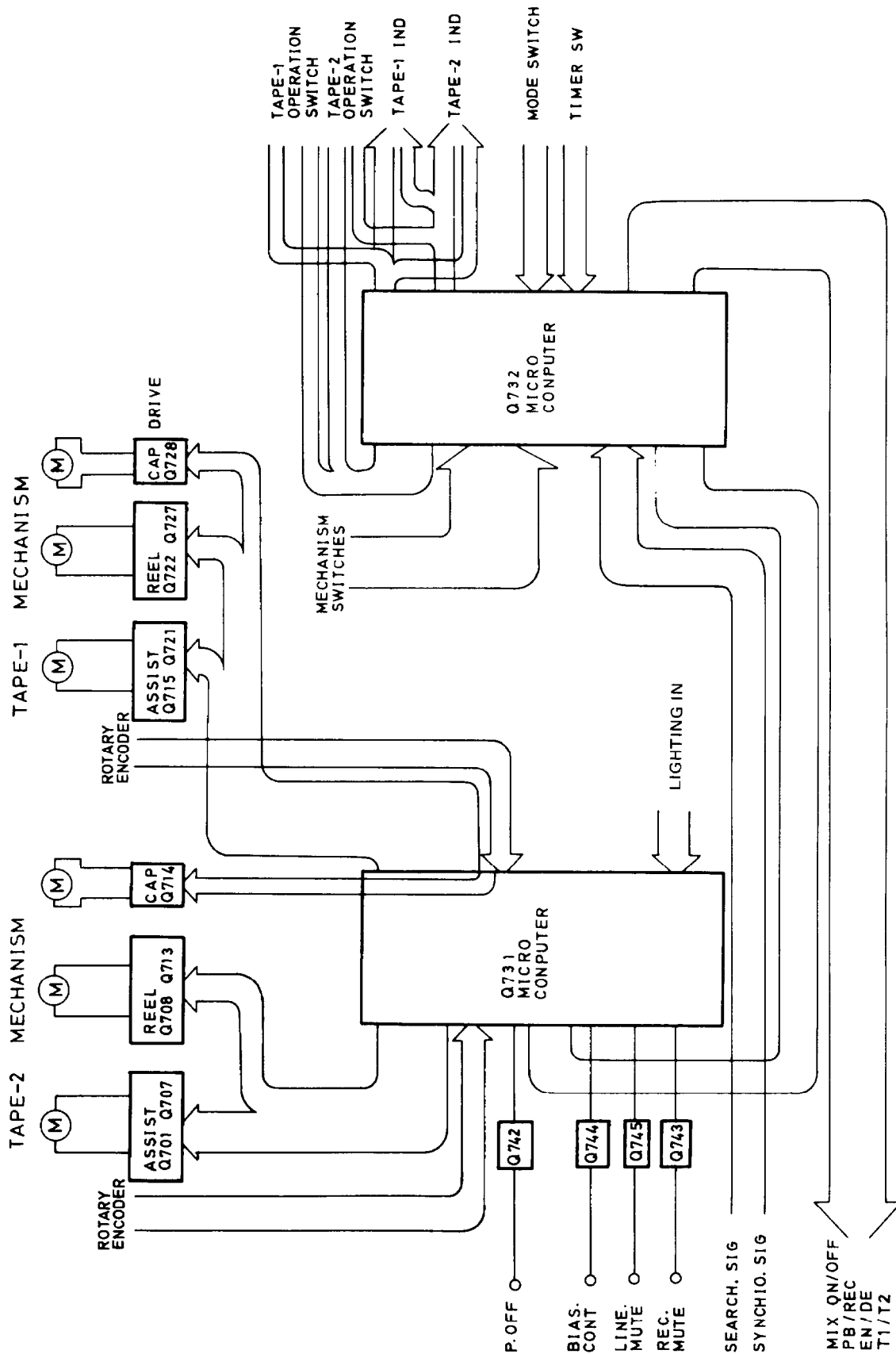
Circuit No.	Parts No.	Description
Mechanism	24606173	50mA, 14V. Lamp 145a

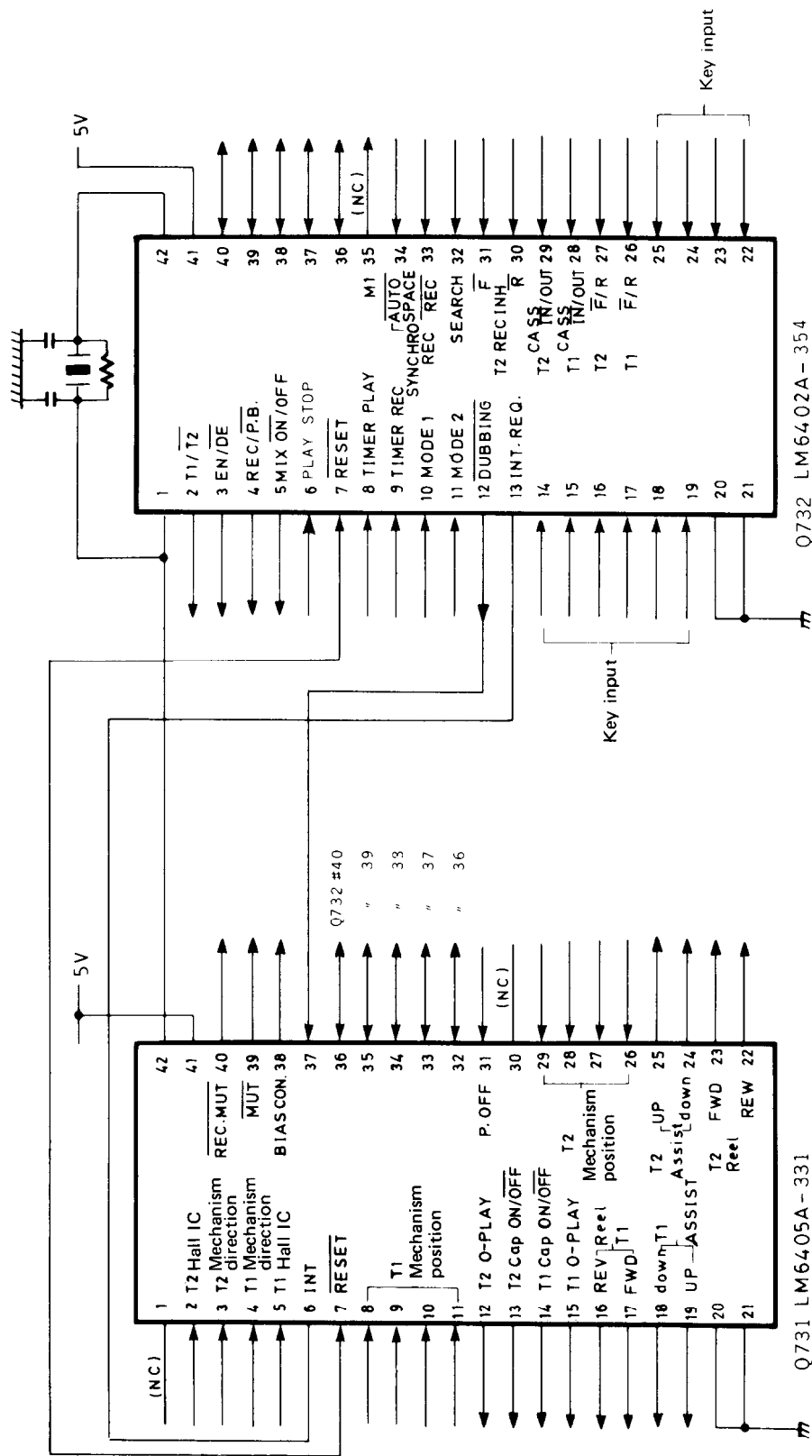
**CAUTION:** Before replacing the lamps, be sure to unplug the power supply cable.

# BLOCK DIAGRAM (AUDIO SECTION)



# BLOCK DIAGRAM (CONTROL SECTION)





TIMER CORD			
Pin No	TIMER REC	OFF	TIMER PLAY
8	H	H	L
9	L	H	H

LM6402A-354

REVERSE CORD			
Pin No	TIMER REC	OFF	TIMER PLAY
10	H	H	L
11	H	H	H

LM6402A-354

## CIRCUIT OPERATIONS

### Basic Operation (Tape-1 Forward play)

1. When the PLAY button is pressed, S701 is turned on and pin 25 of Q732 is switched to the low level by the signal from pin 17.
2. A signal is sent to Q731 by data bus 36 – 40 of Q732 and the output port (pin 19) of Q731 goes to the high level to turn on Q718, then Q720 and Q717 in sequence. The assist motor then begins to rotate in the direction in which the head base is raised.
3. When the head base rises to the specified location, the cam shown in the dismantled mechanism diagram no. 57 causes a 4-bit code (0101) made by leaf switches S1 – S4 to be sent to input ports 8 – 11 of microprocessor Q731. This stops the assist motor at that point. (See page 6.)
4. Output port 15 of Q731 switches to high to turn on Q722 and then Q723 to control the reel motor drive voltage.
5. Output port 17 of Q731 switches to high to turn on Q726 and then Q725 to cause the reel motor to rotate in the forward direction.
6. At the same time, output port 14 of Q731 switches to high to turn on Q728 to cause the capstan motor to rotate.

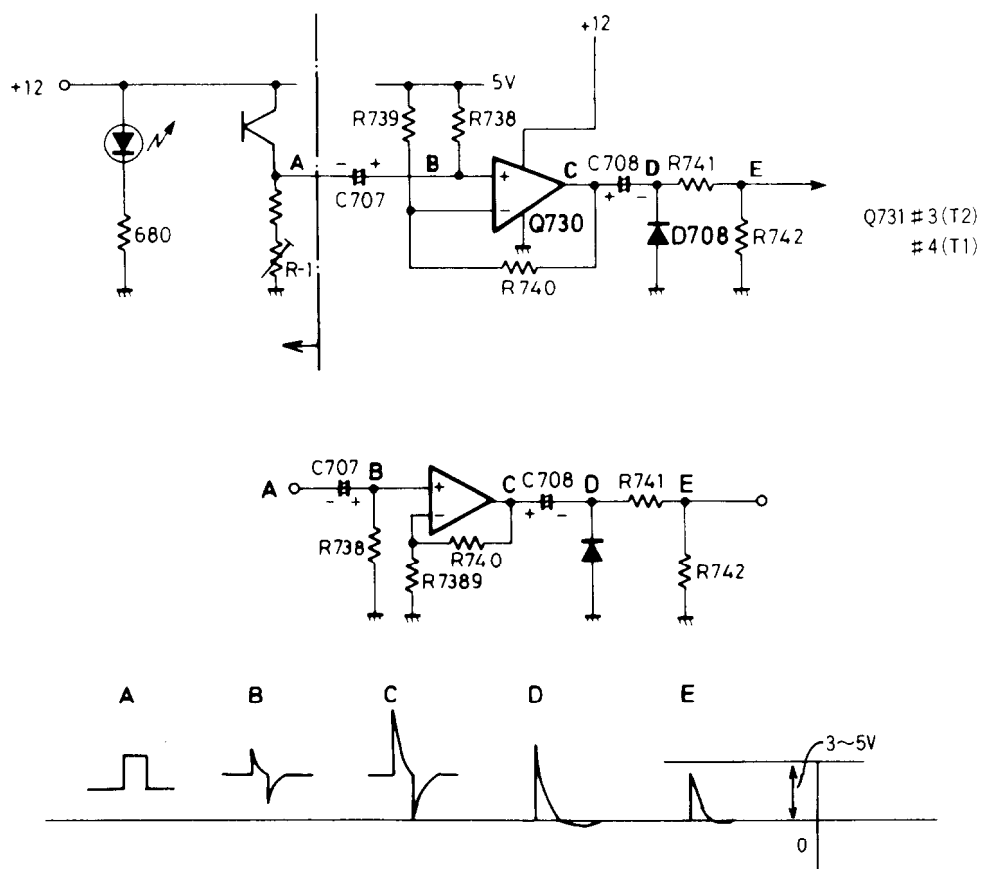
### Auto-Reverse Operation

A photo sensor is used to detect the change in optical permeability between the magnetic tape and leader tape. The difference is then amplified and sent to a microcomputer. The difference in optical permeability is differentiated by C707 and R738, amplified by Q730, R739 and R740 and altered to the TTL level by R741 and R742. After this, the pulse is input at #3 (T2) and #4 (T1) of microcomputer Q731.

#### Mechanism side Microcomputer optical input

The reverse operation sensitivity differs greatly depending on the kind of leader tape. If auto-reverse does not function properly (direction is reversed during magnetic tape section or is not reversed when leader tape is reached), adjust the PC panel semi-fixed volume (R-1), located behind the mechanism.

Start tape transport over the magnetic section of a TDK AD-120 cassette in the forward direction and adjust R-1 so that the voltages between C-707 (T2), C-705 (T1) and ground are 3 – 4 volts.



## MECHANISM OPERATIONS

The rotations of the assist motor are transmitted via the worm gear simultaneously to the cam that raises and lowers the head base, the brake cam and the head reversal cam. Figures 3, 2 and 1 show the configuration of each cam. The sections in the diagrams in which the name of an operation is written within the angular range of that operation indicate the effective operating range of the cam for that particular operation. The — mark indicates that operation is prohibited since the positions of the head base and brake panel are not fixed. The rotary encoder shown in Fig. 4 detects each angular operation range and the 4-bit data, a, b, c and d, are obtained from this encoder. The microcomputer uses these data to check the position of the mechanism and drive the assist motor to the correct position. The relationship between rotary encoder output and the mechanism position is shown in Fig. 5.

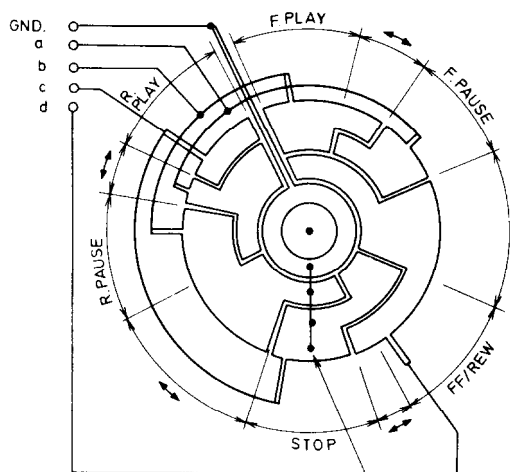


Fig. 4 Rotary encoder

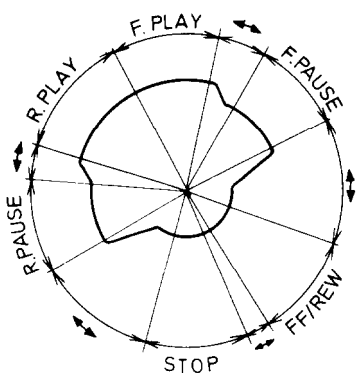


Fig. 1 Head base up-down cam

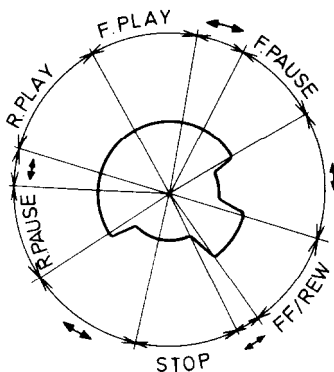


Fig. 2 Brake cam

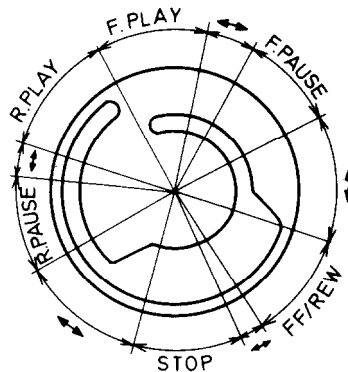
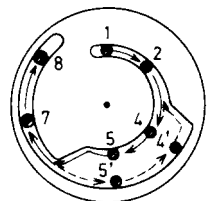
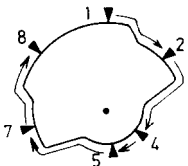


Fig. 3 Head reversal cam

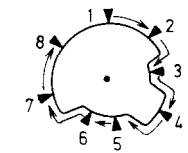
(HEAD-REVERSAL CAM)



HEAD BASE (UP-DOWN CAM)



(BRAKE CAM)



HEAD DIRECTION

FWD

REV

HEAD POSITION

PLAY

PAUSE

STOP

FF/REW

BRAKE

OFF

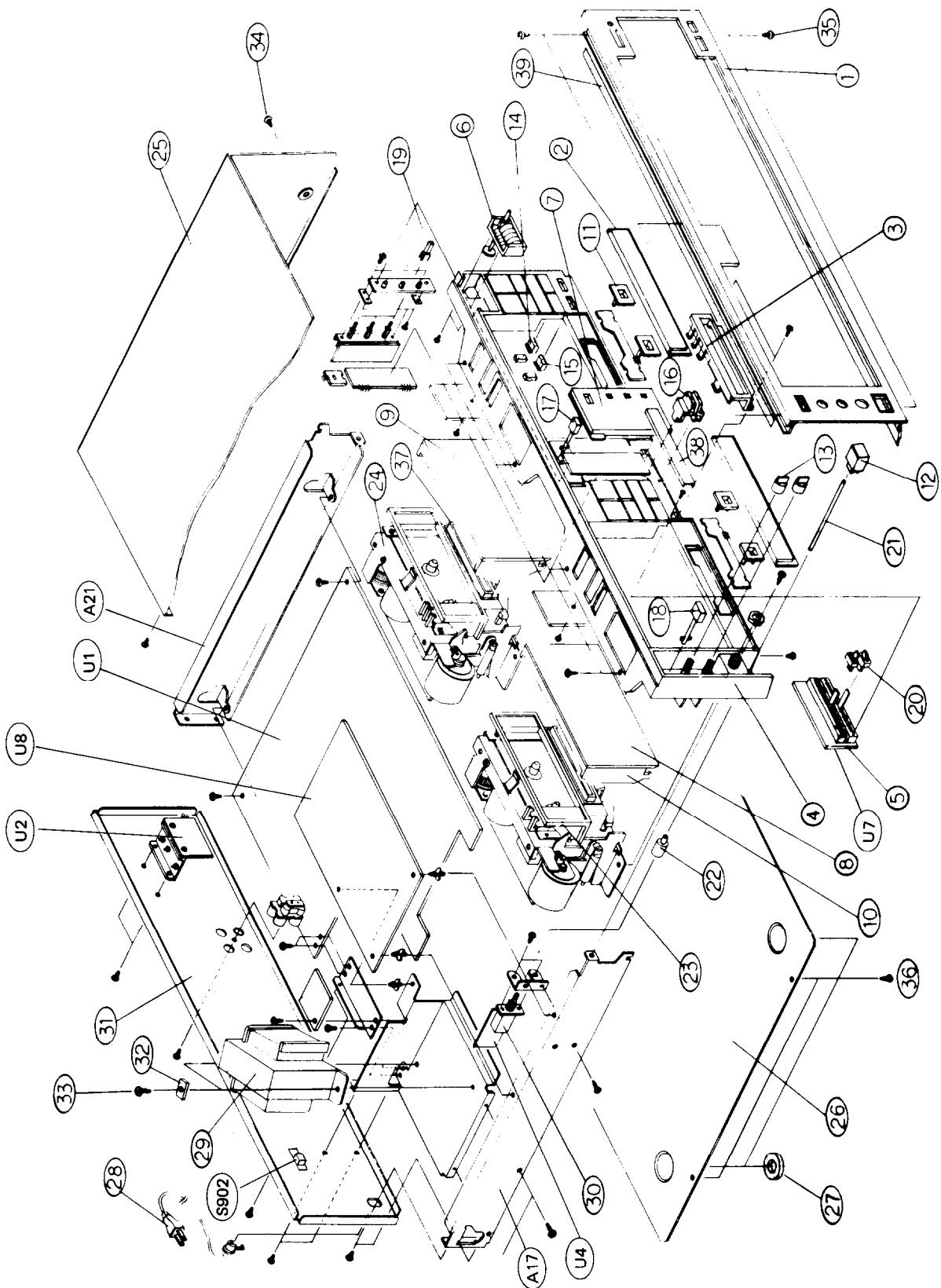
ON

		F. PLAY		F. PAUSE		FF/REW		STOP		R. PAUSE		R. PLAY
	16	5	4	6	7	3	1	9	D	C	E	A
	S4 d	0	0	0	0	0	0	1	1	1	1	1
	S3 c	1	1	1	1	0	0	0	1	1	1	0
	S2 b	0	0	1	1	1	0	0	0	0	1	1
	S1 a	1	0	0	1	1	1	1	1	0	0	0

0: SWITCH ON 0V  
1: SWITCH OFF 5V

Fig. 5

# CHASSIS-EXPLODED VIEW





## PARTS LIST

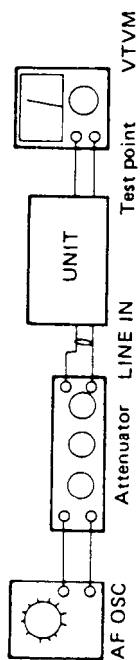
REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
	A2	834426068 2.6TTS+6B (BC), Tapping screw	19	A805	28321292 Knob, mode
	A3	833430080 3TTP+8P (BC), Tapping screw	14	A806	28321293-1 Knob, push (S)
	A4	838426088 2.6TTB+8B (BC), Tapping screw	14		28321395 Knob, push (B)
	A5	27190234 Holder, LED	15	A807	28321294A Knob, push
	A6	28170014 Bushing		A808	28140490 Cushion
	A7	27262155 Plate A	16	A809	28321295B Knob, volume (S)
	A8	82142004 2P+4I (BC), Pan head screw	16		28321396A Knob, volume (B)
20	A9	27273027A Joint	18	A818	28321286-1 Knob, eject (S)
11	A11	27192039 Holer, LED	18		28321287-1 Knob, eject (B)
6	A13	24601147 Counter		C722, C724	352942206 22μF, 16V, Non-polar elect. capacitor
	A14	834426068 2.6TTS+6B (BC), Tapping screw			
	A16	28133087A Back plate	28	Δ P1	253099B AS-UC-3, Power supply cord (D)
	A17	27115150 Side bracket L		Δ	253083-1 AS-CEE, Power supply cord (G)
	A18	834430068 3TTS+6B (BC), Tapping screw		Δ	253118 AS-SAA, Power supply cord (Q)
	A21	27115149C Side bracket R		P2	260208 Binder
	A22	834430068 3TTS+6B (BC), Tapping screw		P3	27300352 Terminal
	A23	831430088 3TTW+8B (BC), Tapping screw		Δ S902	25065123 NSS-1258P, Voltage selector switch (W)
21	A25	27260059 Shaft, switch			
	A29	27130343C Bracket, power transformer	29	Δ T901	230796 NPT-823D, Power transformer (D)
	A30	834430068 3TTS+6B (BC), Tapping screw		Δ	230797 NPT-823G, Power transformer (G)
32	A31	870065 Special washer		Δ	230798 NPT-823DG, Power transformer (W)
33	A32	830440089 4TTC+8C (BC), Tapping screw		Δ	253118 NPT-823Q, Power transformer (Q)
	A33	27140821A Bracket, pc board	30	Δ C901	3500065A 0.01μ AC240V Capacitor
	A34	831430088 3TTW+8B (BC), Tapping screw	30	Δ S901	25035375 NPS-111-L339P Power switch
31	A36	27120582 Back panel (D)		U1	11188522D NAAI-1822d, Rec./pb. amplifier pc board ass'y
		27120583 Back panel (G)			
		27120584 Back panel (W)		U2	11000523 NAPS-1823, Power supply pc board ass'y
		27120617 Back panel (Q)			
	A37	834430108 3TTS+10B (BC), Tapping screw		U3	11000524 NASW-1824, Dolby switch circuit pc board ass'y
	A38	834430068 3TTS+6B (BC), Tapping screw		U4	11188525B NASW-1825b, Power switch pc board ass'y
	A40	270025 SR-3P-4, Strainrelief (D)			
		270280 SR-4K-4, Strainrelief G/R100/W		U5	11188526A NAHP-1826a, Headphone terminal pc board ass'y (S)
	A42	27150169 Shielded plate			
	A43	27190009 Holder			
4	A45	28321407-1A Knob ass'y (Included the front bracket) (S)			
4		28321408-1 Knob ass'y (Included the front bracket) (B)		U6	11000527 NADIS-1827, Meter LED pc board ass'y
25	A301	28184208 Top cover (S)		U7	11002528A NAVR-1828a, Input volume pc board ass'y
25		28184225 Top cover (B)			
34	A302	834430068 3TTS+6B (BC), Tapping screw		U8	11188530D NACOC-1830d, Control circuit pc board ass'y
1	A501	11188121 Front panel ass'y (S)		U9	11000531 NASW-1831, Mode switch pc board ass'y
	A502	27267299 Guide, eject			
	A503	27267215 Guide, power		U10	11000532 NADIS-1832, Mode indication pc board ass'y
1		11208121 Front panel ass'y (B)			
35	A505	833430080 3TTP+8P (BC), Tapping screw		U11	11000533 NASW-1833, Timer switch pc board ass'y
39	A507	28140546 10 x 390 x 0.5, Cushion		U12	11000534 NADIS-1834, Direction indicator pc board ass'y for T-1
2	A508	28191216A Clear plate D (S)		U13	11000535 NADIS-1835, Direction indicator pc board ass'y for T-2
2		28191226A Clear plate D (B)		U14	11000536 NADIS-1836, Dubbing indicator pc board ass'y
38	A509	27262237-1 Plate, volume (S)		U15	11000539 NADIS-1839, Tact switch pc board ass'y for T-1
38		27262256-1 Plate, volume (B)		U16	11000540 NADIS-1840, Tact switch pc board ass'y for T-2
3	A510	27267300-1 Guide, volume (S)		U17	11000542 NADIS-1842, High speed indicator pc board ass'y
3		27267320-1 Guide, volume (B)		U18	11000542A NADIS-1842a, Indicator pc board ass'y
35	A511	833430080 3TTP+8P (BC), Tapping screw		U19	11188552B NAMC-1952b, Mic. terminal pc board ass'y (S)
7	A514	28191217 Clear plate (S)			11208552C NAMC-1952c, Mic terminal pc board ass'y (B)
7		28191227 Clear plate (B)	23	Z1	244052C NDM-47, Deck mechanism ass'y for T-1
10	A515	28400155 Cassette lid			
8	A516	28400156 Window, tape 1 (S)	24	Z2	244054C NDM-49, Deck mechanism ass'y for T-2
8		28400179 Window, tape 1 (B)			
9	A517	28400157 Window, tape 2 (S)			
9		28400180 Window, tape 2 (B)			
26	A631	27170167A Bottom board			
27	A632	27175011C Leg			
35	A633	833430080 3TTP+8P (BC), Tapping screw			
34	A634	834430068 3TTS+6B (BC), Tapping screw			
18	A801	28321286A Knob, eject (S)			
18		28321287A Knob, eject (B)			
12	A802	28320852 Knob, power (S)			
12		28321160 Knob, power (B)			
13	A803	28320797 Knob, selector (S)			
13		28321130 Knob, selector (B)			

Note: The components identified by mark are critical for risk of fire and electric shock. Replace only with parts number specified.

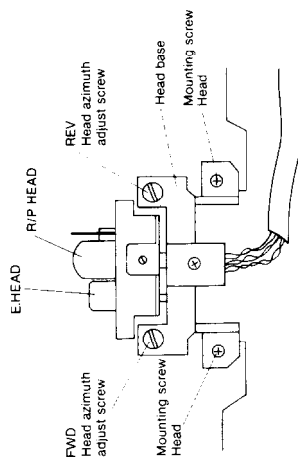
Note: D : Only 120V model Q : Only 240V model  
G : Only 220V model S : Only silver model  
W : Only 120/220V model B : Only black model

## ADJUSTMENT PROCEDURES

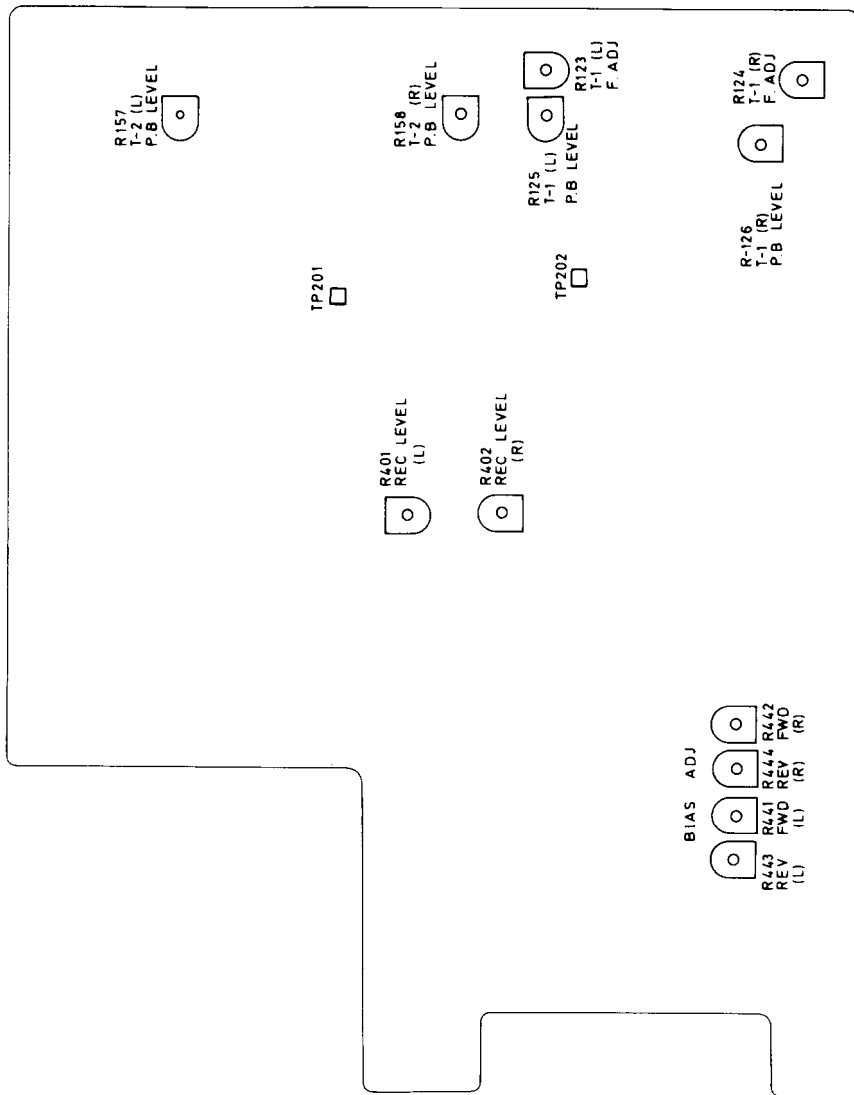
Item	Connection of instrument	LINE input	Test tape	Mode	Output indicator	Adjustment point	Adjust for	Remarks
1	AC voltmeter to test points TP-201 and TP-202		MTT-150	TAPE-1 playback	AC	R125(L ch.)	580mV	
					voltmeter	R126(R ch.)		
2	AC voltmeter to test points TP-201 and TP-202		MTT-150	TAPE-2 playback	AC	R157(L ch.)	580mV	
					voltmeter	R158(R ch.)		
	AC voltmeter to test points TP-201 and TP-202		VTT-658	TAPE-2 playback	AC	Head azimuth screw of TAPE-2	Maximum output	Proceed to both sides. If the peak output reads of the right and left channels are different, adjust so that the output of left(right) channel becomes maximum at the forward (reverse) mode. Before adjust the head azimuth of TAPE-1, set R123 and R124 to the center position.
					voltmeter	Head azimuth screw of TAPE-1	Maximum output	
	AC voltmeter to test points TP-201 and TP-202		VTT-658	TAPE-1 playback	AC	R123 (L ch)	Same level	
					voltmeter	R124 (R ch)		
3	Frequency counter to test points TP-201 and TP202		MTT-111	TAPE-1 playback	Frequency counter	Semifixed resistor on the motor	3,015Hz to 3,025Hz	
					Frequency counter	Semifixed resistor on the motor		2,995Hz to 3,005Hz
4	fig. 1	1kHz, -23dB & 12kHz, -23dB -23dB(Output of LINE OUT is 35mV.)	NEW UD-90 Blank tape	TAPE-2 recording		R441(FWD Lch.)		Proceed to the both sides. Set the input volume to the maximum position.
						R442(FWD Rch.)		
				TAPE-2 playback	AC	R443(REV Lch.)	Playback outputs of 1kHz and 12kHz become same level.	
					voltmeter	R444(REV Rch.)		
5	fig. 1	1kHz, -0dB(Output is 350mV.)	NEW UD-90 Blank tape	TAPE-2 recording	AC	R401(Lch.)	350mV	Set the input volume to the maximum position.
					voltmeter	R402(Rch.)		
				TAPE-2 playback	AC		350mV	
6	Play torque		TW-2111	TAPE-1 and TAPE-2 playback	TW-2111	R727(TAPE-1)	45grcm to 55grcm	Proceed to adjustment at the forward mode.
						R711(TAPE-2)		



(fig. 1)



PLAY TORQUE ..... 30 – 65g/cm  
 FF. REW TORQUE ..... 70 – 160g/cm  
 BACK TENSION ..... 3 – 7g/cm

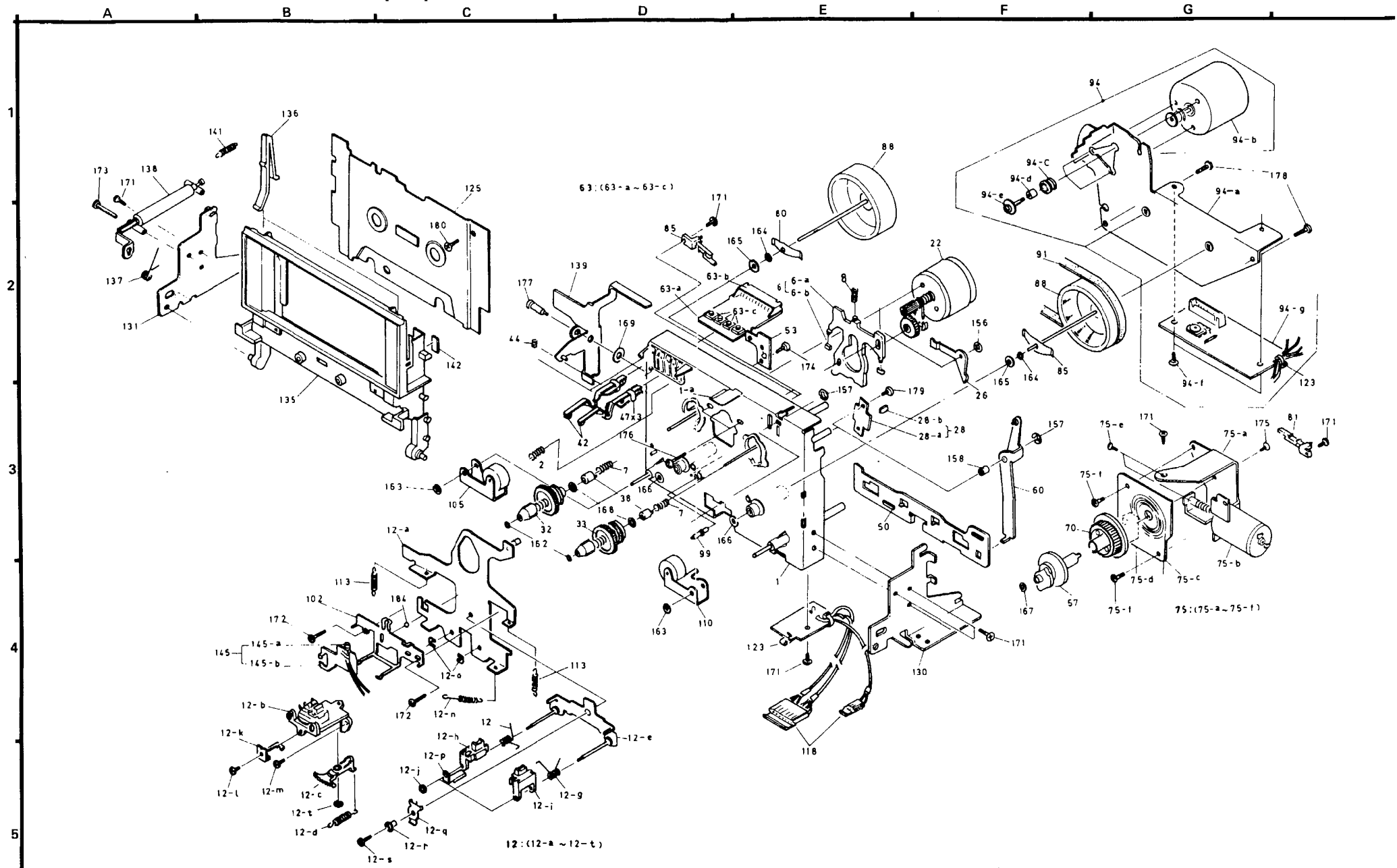


NAAF-1822d

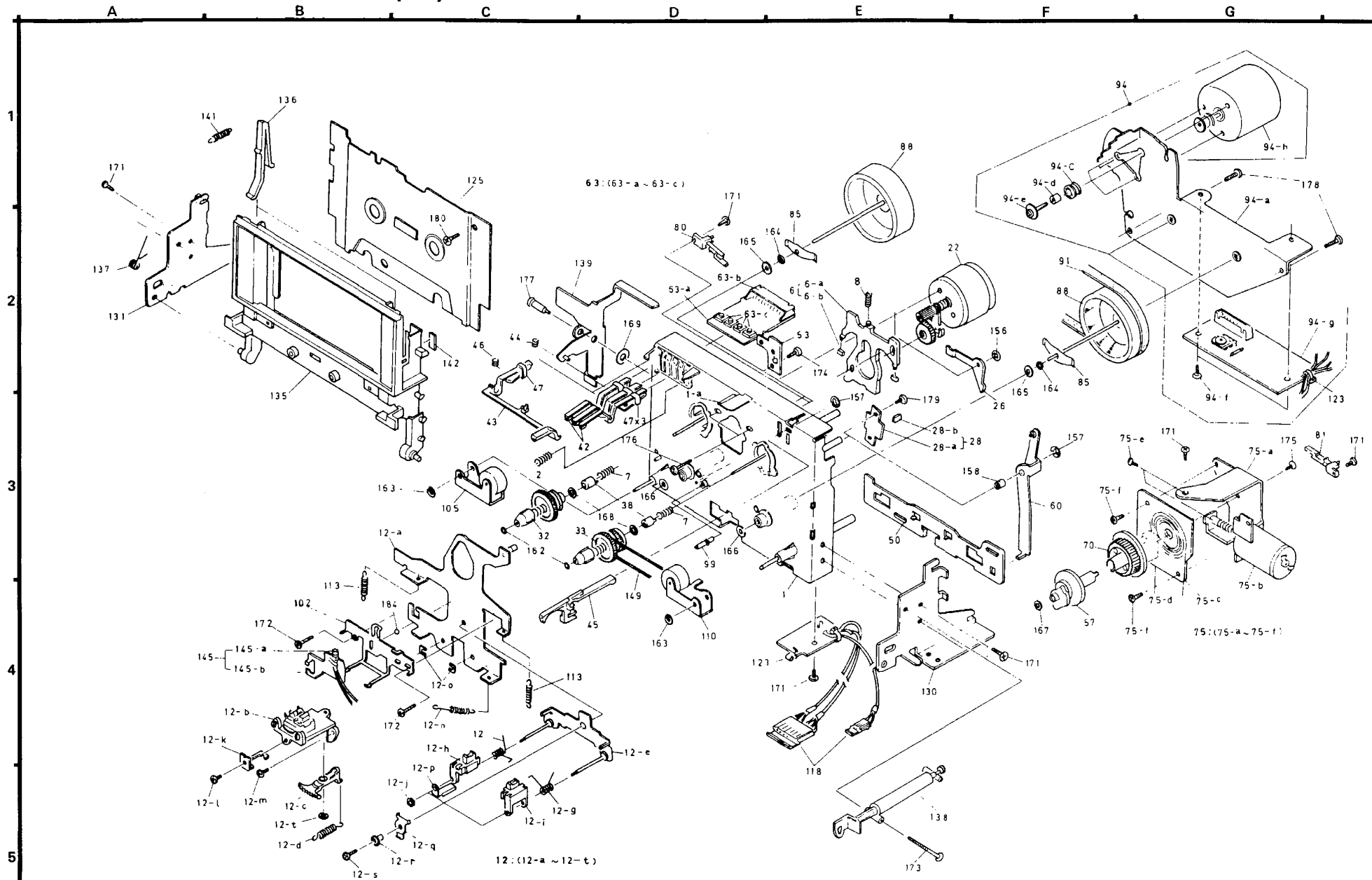
# TAPE MECHANISM-PARTS LIST (NDM-47 T-1)

REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
1	24610983	Chassis	88	24602250	Flywheel
1a	24605468	Cassette holding spring	91	24602222	Flat belt
2	24605481	Tension spring	94a	24610996	Motor bracket
6	24610984	Brake plate ass'y	94b	24601139	Motor ass'y
6a	24610961	Brake plate	94c	24610451	Cushion
6b	24610999	Brake rubber	94d	24610807	Spacer
7	24605466	Tension spring, back tension	94e	801301	Pan head screw
8	24605472	Tension spring, brake	94f	8233125059	M2. 5 x 5, Pan head screw
12	24611000	Head base ass'y	94g	24606189	pc board ass'y
12a	24610987	Head base	99	24610936	Guide
12b	24600042	Head ass'y	102	24610989	Holding plate, head
12c	24610947	Wheel	105	2462223A	Pinch arm R
12d	24605459	Tension spring	110	24602224A	Pinch arm F
12e	24610988	Selector plate	113	24605454	Spring
12f	24605457	Tension spring	118	24606193	Connector ass'y
12g	24605458	Tension spring	123	260208	Binder
12h	24610945	Tape guide L	125	24610979	Panel ass'y
12i	24610946	Tape guide R	130	24610990	Side panel L
12j	863120	M2, Nut	131	24610991	Side panel R
12k	24611001	Holder, spring	135	24610992	Cassette holder
12l	801292	M2 x 4, Trass tapping screw	136	24610993	Spring, cassette holder
12m	801250	Pan head screw with spring	137	24605470	Spring
12n	24605473	Tension spring	138	24610994	Damper
12o	24604057	Spacer	139	24611005	Canceller lever ass'y
12p	24611002	Holder, lead wire	141	24605471	Spring
12q	24605474	Holding spring	142	24611006	Cushion
12r	24604058	Collar	145	24606168	Holder ass'y, lamp
12s	82212005	M2 x 5, Flat head screw	145a	24606173	50mA, 14V, Lamp
12t	24611003	1.8 x 3. 8 x 0. 5t, Flat washer	145b	24610498	Lamp holder
22	24601145	Reel motor ass'y	156	891024	CS2. 4, Circlip
26	24603277	Brake lever	157	893030	E3, Circlip
28	24606190	Hall IC pc board ass'y	158	24604055	4 x 6, Spacer
28b	222558	Hall IC	162	24610349	1.8 $\phi$ x 3.2 x 0.5t, Washer
32	24602233	Supply reel ass'y	163	24610973	2.7 $\phi$ x 6 x 0.5t, Washer 1
33	24602243	Take-up reel ass'y	164	24610515	2.6 $\phi$ x 4.7 x 0.25t, Washer
42	24603278A	Switch lever	165	24610972	2.6 $\phi$ x 7 x 0.13t, Washer 1
44	24605480	Tension spring	166	24610673	2.5 $\phi$ x 7 x 0.8t, Washer
47	24611004	Frame, switch lever	167	24610944	4.1 $\phi$ x 5.8 x 0.1t, Washer
50	24603276	Slide lever	168	24611007	2.1 $\phi$ x 4 x 0.13t, Washer
53	24606185	L.E.D pc board ass'y	169	24611008	5.5 $\phi$ x 10 x 0.3t, Washer
57	24602220	Cam	171	833125059	M2.5 x 5, Pan head screw
60	24603273	Selector lever	172	833125089	M2.5 x 8, Pan head screw
63	24606192	Detection switch pc board ass'y	173	833125149	M2.5 x 14, Pan head screw
63c	25035389 or 25035275	Tact switch	174	833125069	M2.5 x 6, Pan head screw
70	24602221	Rotary gear ass'y	175	801250	M2 x 4, Pan head screw
75a	24601153	Holding plate	176	82112614	M2.6 x 14, Pan head screw
75b	24601156	Motor ass'y	177	801303	Special screw
75e	82112003	M2 x 3, Pan head screw	178	833126105	M2.6 x 10, Tapping screw
75f	833125059	M2. 5 x 5, Pan head screw	179	833126055	M2.6 x 5, Tapping screw
80	24606166	Leaf switch	180	833426055	M2.6 x 5, Tapping screw
85	24605436	Thrust spring	184	24610943	3 $\phi$ , Steel ball

TAPE MECHANISM-EXPLODED VIEW (T-1)



## TAPE MECHANISM-EXPLODED VIEW (T-2)



# TAPE MECHANISM-PARTS LIST (NDM-48 T-2)

REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
1	24610983	Chassis	81	24606188	Leaf switch
1a	24605468	Cassette holding spring	85	24605436	Thrust spring
2	24605481	Tension spring	88	24602250	Flywheel
6	24610984	Brake plate ass'y	91	24602222	Flat belt
6a	24610961	Brake plate	94a	24610996	Motor bracket
6b	24610999	Brake rubber	94b	24601139	Motor ass'y
7	24605466	Tension spring, back tension	94c	24610451	Cushion
8	24605472	Tension spring, brake	94d	24610807	Spacer
9	24605482	Tension spring	94e	801301	Pan head screw
12	24610986	Head base ass'y	94f	8233125059	M2.5 x 5, Pan head screw
12a	24610987	Head base	94g	24606189	pc board ass'y
12b	24600043	Head ass'y	99	24610936	Guide
12c	24610947	Wheel	102	24610989	Holding plate, head
12d	24605459	Tension spring	105	24602223A	Pinch arm R
12e	24610988	Selector plate	110	24602224A	Pinch arm F
12f	24605457	Tension spring	113	24605454	Spring
12g	24605458	Tension spring	118	24606193	Connector ass'y
12h	24610945	Tape guide L	123	260208	Binder
12i	24610946	Tape guide R	125	24610979	Panel ass'y
12j	863120	M2, Nut	130	24610990	Side panel L
12k	24611001	Holder, spring	131	24610991	Side panel R
12l	801292	M2 x 4, Trass tapping screw	135	24610992	Cassette holder
12m	801250	Pan head screw with spring	136	24610993	Spring, cassette holder
12n	24605473	Tension spring	137	24605470	Spring
12o	24604057	Spacer	138	24610994	Damper
12p	24611002	Holder, lead wire	139	24611005	Canceller lever ass'y
12q	24605474	Holding spring	141	24605471	Spring
12r	24604058	Collar	142	24611006	Cushion
12s	82212005	M2 x 5, Flat head screw	145	24606168	Holder ass'y, lamp
12t	24611003	1.8 x 3.8 x 0.5t, Flat washer	145a	24606173	50mA, 14V, Lamp
22	24601145	Reel motor ass'y	145b	24610498	Lamp holder
26	24603277	Brake lever	149	24602239	Belt
28	24606190	Hall IC pc board ass'y	156	891024	CS2.4, Circlip
28b	222558	Hall IC	157	893030	E3, Circlip
32	24602233	Supply reel ass'y	158	24604055	4 x 6, Spacer
33	24602243	Take-up reel ass'y	162	24610349	1.8 $\phi$ x 3.2 x 0.5t, Washer
42	24603278A	Switch lever	163	24610973	2.7 $\phi$ x 6 x 0.5t, Washer 1
43	24603275A	Switch lever, metal	164	24610515	2.6 $\phi$ x 4.7 x 0.25t, Washer
44	24605480	Tension spring	165	24610972	2.6 $\phi$ x 7 x 0.13t, Washer 1
45	24603271	Recording lever ass'y	166	24610673	2.5 $\phi$ x 7 x 0.8t, Washer
46	24605476	Spring	167	24610944	4.1 $\phi$ x 5.8 x 0.1t, Washer
47	24611004	Frame, switch lever	168	24611007	2.1 $\phi$ x 4 x 0.13t, Washer
50	24603276	Slide lever	169	24611008	5.5 $\phi$ x 10 x 0.3t, Washer
53	24606185	L.E.D. pc board ass'y	171	833125059	M2.5 x 5, Pan head screw
57	24602220	Cam	172	833125089	M2.5 x 8, Pan head screw
60	24603273	Selector lever	173	833125149	M2.5 x 14, Pan head screw
63	24606186	Detection switch pc board ass'y	174	833125069	M2.5 x 6, Pan head screw
63c	25035389 or 25035275	Tact switch	175	801250	M2 x 4, Pan head screw
70	24602221	Rotary gear ass'y	176	82112614	M2.6 x 14, Pan head screw
75a	24601153	Holding plate	177	801303	Special screw
75b	24601156	Motor ass'y	178	833126105	M2.6 x 10, Tapping screw
75e	82112003	M2 x 3, Pan head screw	179	833126055	M2.6 x 5, Tapping screw
75f	833125059	M2.5 x 5, Pan head screw	180	833426055	M2.6 x 5, Tapping screw
80	24606166	Leaf switch	184	24610943	3 , Steel ball

# PRINTED CIRCUIT BOARD PARTS LIST

Rec./pb. amplifier pc board (NAAF—1822d)

CIRCUIT NO.	PARTS NO.	DESCRIPTION	CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs		L403, L404	24606080 or 231038	NCH1022 or NCH2078
Q121, Q207	222736	NJM4558S			
Q203, Q204	222729	HA12058NT	L405, L406	24606076 or 231037	NCH1014 or NCH2077
Q301, Q302	222623	IR2E02			
Q303	222652	M5218L	L407, L408	233186	NCH3032
Q401	222808 or 222465	M5218P or NJM4558D	L409, L410	231025	NCH10664
Q501	222681 or 222695	IR3702 or LA6324	Z001	Osc. block 246066183	NBO-026
Q905	222780050	7805		Capacitors	
	Transistors		C103, C104	392880337	3.3 $\mu$ F, 50V, LL
Q101–Q108	2211896, 2212256 or 2211406	2SC1815 (LL), 2SC2458 (LL) or 2SC2240 (BL)	C109, C110	352741009	10 $\mu$ F, 16V, Elect.
			C113, C114	357241009	10 $\mu$ F, 16V, Elect.
Q109–Q112	2211255,	2SC1815 (GR),	C133, C134	392880337	3.3 $\mu$ F, 50V, LL
Q403–Q414	2211256,	2SC1815 (BL),	C139, C140	352741009	10 $\mu$ F, 16V, Elect.
Q422, Q423	2210746, 2212115 or 2212485	2SC945A (P), 2SC2458 (GR) or JC501 (Q)	C143, C144	352741009	10 $\mu$ F, 16V, Elect.
			C151–C154	352750479	4.7 $\mu$ F, 25V, Elect.
Q123–Q128	2212302, 2212303 or 2212304	2SK381 (B), 2SK381 (C) or 2SK381 (D)	C201, C202	352741009	10 $\mu$ F, 16V, Elect.
			C203, C204	352780109	1 $\mu$ F, 50V, Elect.
Q129, Q130	2211455, 2212125 or 2212495	2SA1015 (GR), 2SA1048 (GR) or JA101 (Q)	C205, C206	352741009	10 $\mu$ F, 16V, Elect.
			C207, C208	352732219	220 $\mu$ F, 10V, Elect.
Q205, Q206	2211706	2SD655 (F)	C213, C214	392850477	4.7 $\mu$ F, 25V, LL
Q415	2201060	2SD549	C217, C218	352783399	0.33 $\mu$ F, 50V, Elect.
Q416 Q419	2211454,	2SA1015 (Y),	C219, C220	352781599	0.15 $\mu$ F, 50V, Elect.
Q420, Q502	2212124 or	2SA1048 (Y) or	C221, C222	352784799	0.47 $\mu$ F, 50V, Elect.
Q604	2212494	JA101 (Q)	C223, C224	352786899	0.68 $\mu$ F, 50V, Elect.
Q417, Q418	2211254	2SC1815 (Y),	C225, C226	352732209	22 $\mu$ F, 10V, Elect.
Q421, Q605	2211253 or	2SC1815 (O) or	C237, C238	392850477	4.7 $\mu$ F, 25V, LL
Q601–Q603	2212484	JC501 (P)	C241, C242	352781599	0.15 $\mu$ F, 50V, Elect.
	Diodes		C243, C244	352784799	0.4 $\mu$ F, 50V, Elect.
D101–D105	223105,	1S1555,	C245, C246	352750479	4.7 $\mu$ F, 25V, Elect.
D401, D501	223133 or	DS442X or	C301, C302	352741009	10 $\mu$ F, 16V, Elect.
D404–D408	223145	1S2076TD	C303, C304	352780109	1 $\mu$ F, 50V, Elect.
D402, D403	2239673, 2239691, 2241152 or 2241153	RD15EB3, RD16EB1, GZA15Y or GZA15Z	C305, C306	352750479	4.7 $\mu$ F, 25V, Elect.
			C401, C402	352741009	10 $\mu$ F, 16V, Elect.
D600	223155	1SS138	C403, C404	352782299	0.22 $\mu$ F, 50V, Elect.
D601, D602	2239652, 2239653, 2241131, 2241132, 2242902, 2242911, 2243242 or 2243243	RD13EB2, RD13EB3, GZA13X, GZA13Y, EQA01-12B, EQA02-13A, MTZ-13B or MTZ-13C	C417, C418	352750479	4.7 $\mu$ F, 25V, Elect.
			C423	352750479	4.7 $\mu$ F, 25V, Elect.
D603	223132	1K60	C424	352732219	220 $\mu$ F, 10V, Elect.
D604	223105, 223133 or 223145	1S1555, DS442X or 1S2076TD	C426, C427	352780109	1 $\mu$ F, 50V, Elect.
			C429	352750479	4.7 $\mu$ F, 25V, Elect.
D605	2239493 or 2240972	RD6.2EB3 or GZA6.2Y	C507	352741009	10 $\mu$ F, 16V, Elect.
			C508, C509	352780109	1 $\mu$ F, 50V, Elect.
D901	223868	2W02	C510, C601	352741009	10 $\mu$ F, 16V, Elect.
D902	223862	WL01	C602	352780109	1 $\mu$ F, 50V, Elect.
D905	223842	GP15B	C902	352752229	2,200 $\mu$ F, 25V, Elect.
	Coils		C903, C904	352751029	1,000 $\mu$ F, 25V, Elect.
L201, L202	233306	NMC-6043	C910, C911	352744709	47 $\mu$ F, 16V, Elect.
L203, L204	233245	NMC2029	C913	3504168	13,000 $\mu$ F, 25V Elect.
L401, L402	24606072 or 231040	NCH1010 or NCH2080	C914	352783399	0.3 $\mu$ F, 50V, Elect.
			C915	352781099	0.1 $\mu$ F, 50V, Elect.
			C951, C952	352732219	220 $\mu$ F, 10V, Elect.
			C956	352744709	47 $\mu$ F, 16V, Elect.
			C957, C958	352741019	100 $\mu$ F, 16V, Elect.
			Resistors		
			R123–R126	5215046 or	N08HR50KBC,
			R157, R158	5215023	Semi-fixed
			R401, R402	5215044 or	N08HR5KBC,
				5215020	Semi-fixed
			R441, R442	5215047 or	N08HR100KBC,
			R443, R444	5215024	Semi-fixed
			R445	441521004	10 $\Omega$ , 1/2W, Metal oxide film
			R901	441524794	0.47 $\Omega$ , 1/2W, Metal oxide film
			R908	441722704	27 $\Omega$ , 2W, Metal oxide film
			R958	442525604	56 $\Omega$ , 1/2W, Metal oxide film



CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Relaies	
RL401, RL404	25065174	NRL-2P-1A-DC12-09
	Terminal	
P101	25045120	NPJ4PDBL49, Input/Output
	Plugs	
P102	25055037	NPLG-6P-28
P103	25055042	NPLG-3P
P401	25055038	NPLG-2P-29
P601	25055099	NPLG-2P-83
P602	25055100	NPLG-3P-84
P703	25055102	NPLG-5P-86
P705	25055101	NPLG-4P-85
	Sockets	
P701A	2000261A	NSAS-10P-199
P702A	2000264A	NSAS-8P-202
P704A	2000263A	NSAS-8P-201
	Radiator	
	27160029-1	RAD-07B
	Screw	
	82143006	3P+6F (BC), Pan head screw

### Power supply pc board (NAPS—1823)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC	
Q902	222780120	7812
	Transistors	
Q901	2201340 or	2SD1128 or
	2201350	2SD687
Q903	2211454,	2SA1015 (GR),
	2212125 or	2SA1048 (GR) or
	2212495	JA101 (Q)
Q904	2201275 or	2SB772 (Q) or
	2201276	2SB772 (P)
	Diodes	
D903	2239653 or	RD13EB3 or
	2241132	GZA13Y
D904	223105,	1S1555,
	223133 or	DS442X or
	223145	1S2076TD
	Capacitors	
C905	352742219	220 $\mu$ F, 16V, Elect.
C906	352744709	47 $\mu$ F, 16V, Elect.
C907	352783399	0.33 $\mu$ F, 50V, Elect.
C908, C909	352781099	0.1 $\mu$ F, 50V, Elect.
	Resistors	
R903, R904	441520224	2.2 $\Omega$ , 1/2W, Metal oxide film
	Radiator	
	27160075A	
	Screws	
	831430088	3TTW+8B (BC), Tapping
	82143010	3P+10F (BC), Pan head screw
	Spacers	
	223019	Transistor
	Bush	
	223017	AC-310
	Nuts	
	863430	N-3F-N (BC)

### Dolby switch circuit pc board (NASW—1824)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S601	25030231	NRS-123-25SBM, Rotary switch, Dolby

### Power switch pc board (NASW—1825b)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
C901	3500065A	0.01 $\mu$ F, AC120/240V, Capacitor
	IS	
S901	25035375	NPS-111-L339P, Power switch
C901a	27300601	Cover, capacitor
	27140823	Bracket, power
	82143006	3P+6FN (BC), Pan head screw
	28320135	Connector

### Headphone terminal pc board (NAHP—1826a/b)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
P301	25045149	HLJ0521-01-020, Headphone terminal (S)
	25045148	HLJ0521-01-010, Headphone terminal (B)

### Meter LED pc board (NADIS—1827)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D301, D302	225071	GL-107M12, LED array

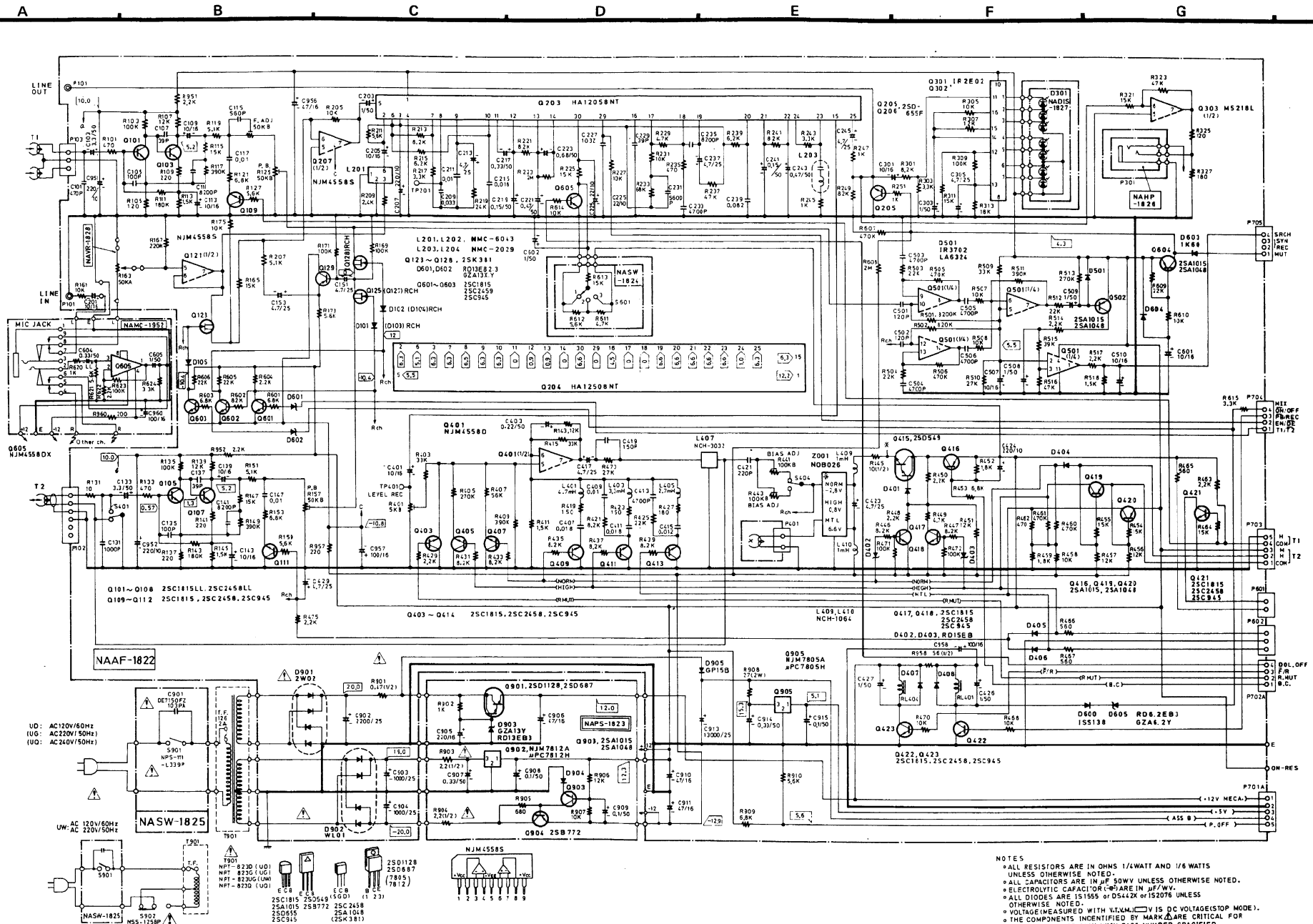
### Input volume pc board (NAVR—1828a)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
R163, R164	6142023	N45LL50KA10Z, Slide variable resistor

### Control circuit pc board (NACOC—1830d)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q729, Q730	222808 or	M5218P or
	222465	NJM4558D
Q731	222764	LM6405A-331
Q732	222765	LM6402A-354
	Transistors	
Q701	2201074 or	2SD880 (Y) or
	2201385	2SD330 (F)
Q702, Q703	2211563	2SB562 (C)
Q704, Q705	2211254,	2SC1815 (Y),
Q708	2212114,	2SC2458 (Y),
	2210747 or	2SC945A (P) or
	2212484	JC501 (P)
Q706, Q707	2211682 or	2SD468 (B) or
	2211683	2SD468 (C)
Q709	2201060	2SD549
Q710, Q711	2211554	2SA562TM (Y)
Q712—Q714	2211706	2SD655 (F)
Q715	2201074 or	2SD880 (Y) or
	2201385	2SD330 (E)
Q716, Q717	2211563	2SB562 (C)
Q718, Q719	2211254,	2SB1815 (Y),
Q722	2212114,	2SC2458 (Y),
	2210747 or	2SC945A (P) or
	2212484	JC501 (P)
Q720, Q721	2211682	2SD468 (B) or
	2211683	2SD468 (C)
Q723	2201060	2SD549
Q724, Q725	2211554	2SA562TM (Y)
Q726—Q728	2211706	2SD655 (F)
Q733—Q736	2211255,	2SC1815 (GR),

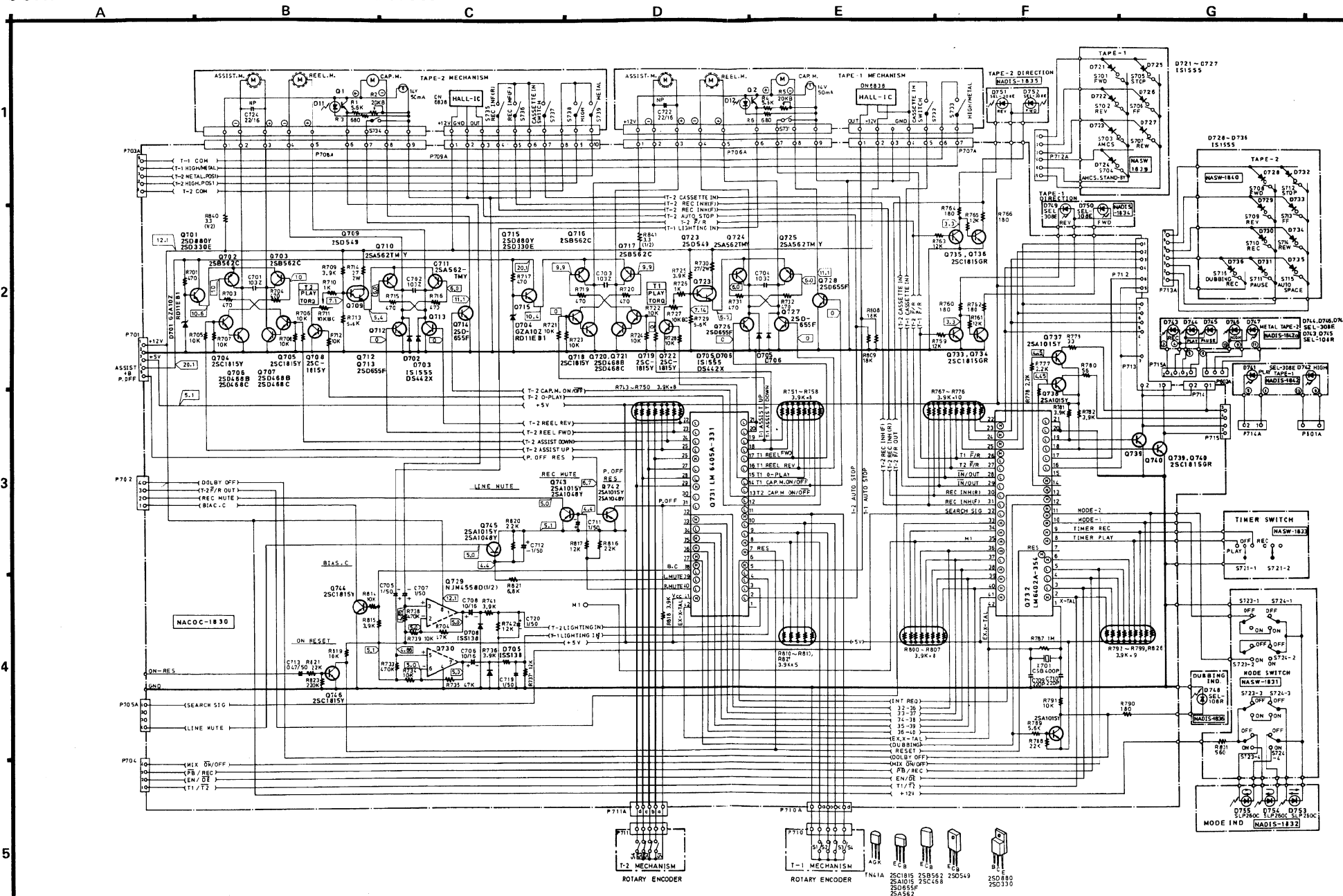
### SCHEMATIC DIAGRAM-AMPLIFIER SECTION



NOTES

- ALL RESISTORS ARE IN OHMS 1/WATT AND 1/6 WATTS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN  $\mu F$  50VW UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS ARE IN  $\mu F/VV$ .
- ALL DIODES ARE 1S1555 OR DS42ZX OR 1S2076 UNLESS OTHERWISE NOTED.
- VOLTAGE (MEASURED WITH V.T.M.)  $\square V$  IS DC VOLTAGE (STOP MODE).
- THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

### SCHEMATIC DIAGRAM-CONTROL SECTION



# PRINTED CIRCUIT BOARD PARTS LIST

(NACOC—1830d)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
Q739, Q740	2212115, 2210746 or 2212485	2SC2458 (GR), 2SC945A (P) or JC501 (Q)
Q737, Q738 Q741—Q743 Q745 Q744, Q746	2211454, 2212124 or 2212494 2211254, 2212114, 2210747 or 2212124	2SA1015 (Y), 2SA1048 (Y) or JA101 (P) 2SC1815 (Y), 2SC2458 (Y), 2SC945A (Q1) or JC501 (P)
	Diodes	
D701, D704	2241073 or 2239611	GZA10Z or RD11EB1
D702, D703 D705, D706	223145, 223105 or 223133	1S2076TD, 1S1555 or DS442X
D707, D708	223105	1SS138
	Ceramic oscillator	
X701	3010078	CSB400P
	Capacitors	
C705, C707 C706, C708 C711, C712 C713 C719, C720	352780109 352741009 352780109 352784799 352780109	1 $\mu$ F, 50V, Elect. 10 $\mu$ F, 16V, Elect. 1 $\mu$ F, 50V, Elect. 0.47 $\mu$ F, 50V, Elect. 1 $\mu$ F, 50V, Elect.
	Resistors	
R711, R727	5215045 or 5215021	N08HR10KBC, Semi-fixed
R714, R730 R743—R750 R751—R758 R767—R776 R792—R799 R800—R807 R810—R813	441722704 49421392408 49421392408 49421392410 49121392409 49121392408 49121392405	27 $\Omega$ , 2W, Metal oxide film 3.9k $\Omega$ x 8, 1/8W, Network 3.9k $\Omega$ x 8, 1/8W, Network 3.9k $\Omega$ x 10, 1/8W, Network 3.9k $\Omega$ x 9, 1/8W, Network 3.9k $\Omega$ x 8, 1/8W, Network 3.9k $\Omega$ x 5, 1/8W, Network
	Sockets	
P703A P705A P706A P707A P708A P709A P710A P711A	2000262A 2000264A 2000265A 2000266A 2000268A 2000267A 2000228A 2000261B	NSAS-10P-200 NSAS-8P-202 NSAS-18P-203 NSAS-14P-204 NSAS-18P-206 NSAS-20P-205 NSAS-10P-132 NSAS-10P-199
	Plugs	
P701 P702, P704, P715 P712 P713 P714	25055102 25055101 25055103 25055104 25055099	NPLG-5P-86 NPLG-4P-85 NPLG-6P-87 NPLG-7P-88 NPLG-2P-83

## Mode switch pc board (NASW—1831)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S722-S724	25035409 27140822 82143006	NPS-242-100-L373, Push switch Bracket, switch 3P+6FN (BC), Pan head screw

## Mode indicator pc board (NADIS—1832)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D753—D755	225093 27270103	SLP-260C, LED Spacer

## Timer switch pc board (NASW—1833)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S721	25030231	NRS-123-25SBM, Rotary switch, timer

## Direction indicator pc boards (NADIS—1834/1835)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D749—D752	225150	SEL308E, LED

## Dubbing indicator pc board (NADIS—1836)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D748	225149 27190239	SEL108R, LED Holder, LED

## Tact switch pc boards (NASW—1839/1840)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D721—D727 D728—D736	223145, 223105 or 223133	1S2076TD, 1S1555 or DS442X
	Switches	
S701—S707 S708—S716	25035389 or 25035275	NPS-111-S353 or NPS-111-S239
	Sockets	
P712A, P713A	2000259	NSAS-6P-197

## High speed Indicator pc board (NADIS—1842)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D741, D742 P601A P714A	225150 2000272 2000271	SEL-308E, LED NSAS-2P-210, Socket NSAS-2P-209, Socket

## Indicator pc board (NADIS—1842a)

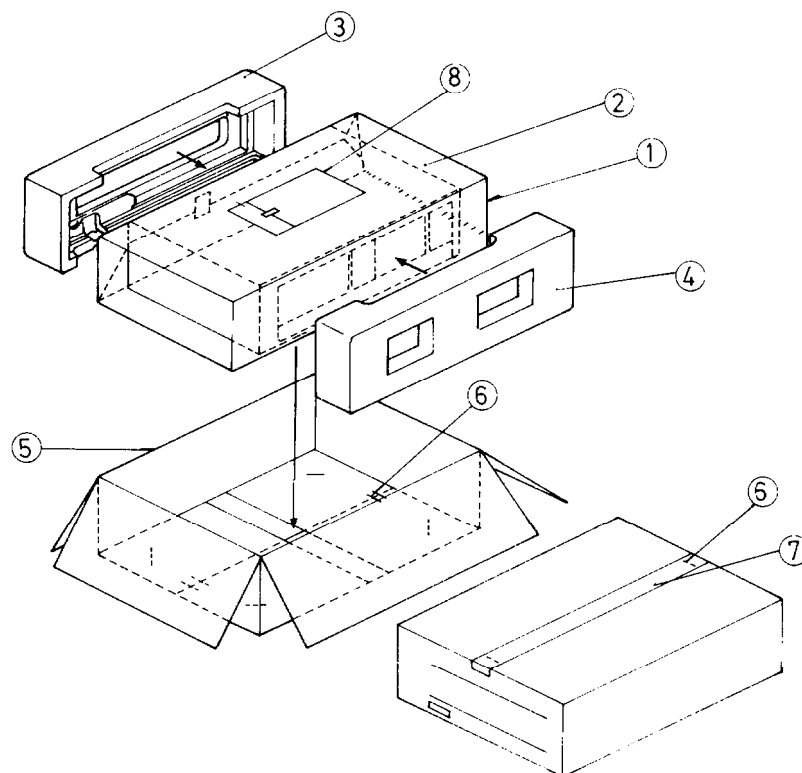
CIRCUIT NO.	PARTS NO.	DESCRIPTION
D743, D745 D744, D746 D747 P602A P715A	225149 225150 225150 2000273 2000274	SEL108R, LED SEL308E, LED SEL308E, LED NSAS-3P-211, Socket NSAS-4P-212, Socket

## Mic. terminal pc board (NAMC—1952b/c)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC	
Q605	222502, 222534 or 222811	NJM4558DX, NJM4559DX or NJM4558DD
	Capacitors	
C604 C605 C960	392883397 352780109 352741019	0.33 $\mu$ F, 50V, LL 1 $\mu$ F, 50V, Elect. 100 $\mu$ F, 16V, Elect.
	Mic. terminal	
P604	25045147 25045146	HLJ4308-01-3012 (S) HLJ4308-01-3010 (B)

NOTE: S : Silver model  
B : Black model

# PACKING VIEW



## D model

REF. NO.	PARTS NO.	DESCRIPTION
1	29100038A	720x950 Poly bag
2	29095019-1	650x800 Protection sheet (B)
3	29090835A	Pad (R)
4	29090834	Pad (F)
5	29050932	Master carton box
	29050934	Master carton box (B)
6	282301	Sealing hook
7	260012	Dampion tape
8	Accessory bag ass'y	
	29340768	Instruction manual
	2010095	Connection cable
	29365006-5	Waranty card (N)
	29358002A	Service station list (N)
	29100005	220x330 Poly bag

## G/W Model

REF. NO.	PARTS NO.	DESCRIPTION
1	29100038A	720x950 Poly bag
2	29095019-1	650x800 Protection sheet (B)
3	29090835A	Pad (R)
4	29090834	Pad (F)
5	29050932	Master carton box
	29050934	Master carton box (B)
6	282301	Sealing hook
7	260012	Dampion tape
8	Accessory bag ass'y	
	29340769	Instruction manual (W)
	2010095	Connection cable
	25055040	Coverion plugCV-K-2 (W)
	29100005	220x330 poly bag

(N) : Only U.S.A. Model

(W) : Only 120/220V Model

(B) : Black Model

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